SIGNIFICANCE OF SCIENTIFIC RESEARCH_X000B_ FOR INTRODUCING EFFECTIVE POLICY MEASURES TO OVERCOME CHALLENGES - POWERPOINT PRESENTATION AT MART 2019 EXPERT MEETING

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Significance of Scientific Research for Introducing Effective policy measures to overcome challenges

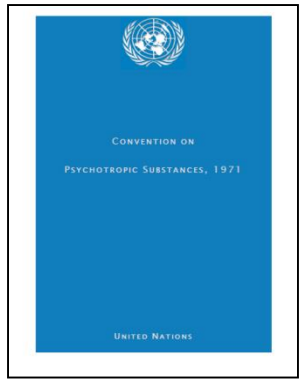
The National Narcotics Laboratory
National Dangerous Drugs Control Board

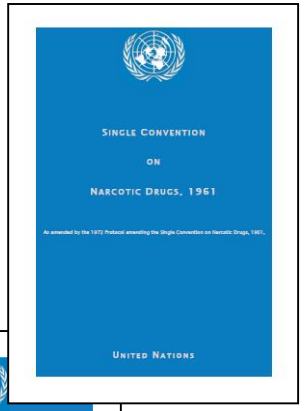
Background

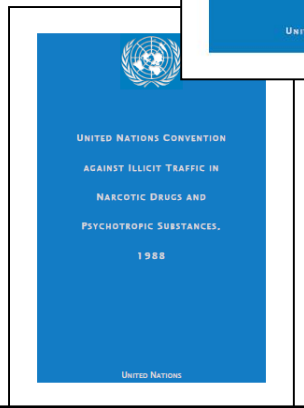
International Conventions rerating to Drug Control

In recognition of the problems that may be caused by the inappropriate use of such medication, their use has been regulated by three major drug control treaties:

- The Single Convention on Narcotic Drugs of 1961
- The Convention on Psychotropic Substances of 1971
- The United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances , 1988







- The overall aims of these treaties are to ensure the availability of these medications **for medical and scientific purposes**, and **to prevent their diversion into illicit drug market.**

Sri Lanka is obliged to take legislative and administrative measures to give effect to and carry out the provisions of this Conventions for control of drugs/substances of abuse which includes narcotic drugs and psychotropic substances.

The Goal of the Government

In terms of the National Policy

The Goal

" The overall goal of the Government of the Democratic Socialist Republic of Sri Lanka in relation to the problem of drug abuse, is to reduce supply and use to the barest minimum while working towards its total elimination from the society."

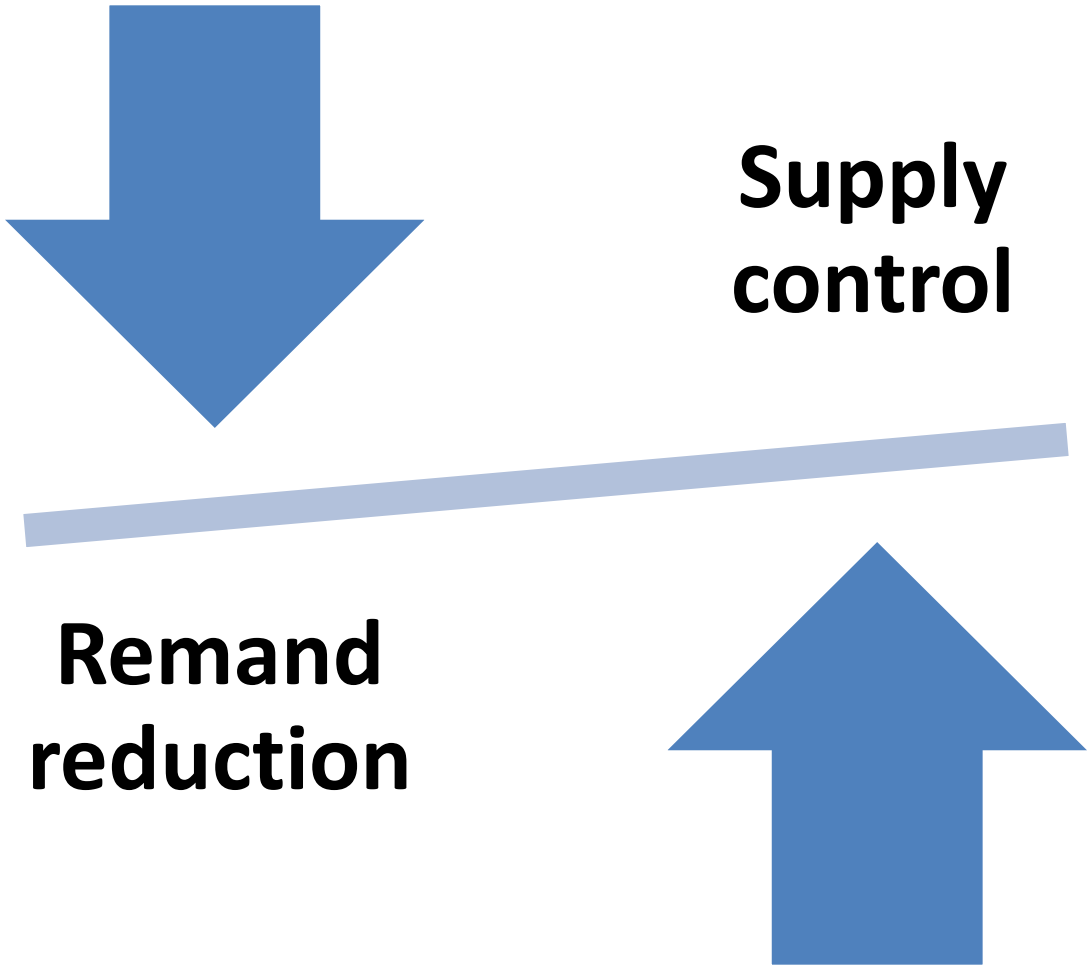
Drug Prevention and Control Strategies

In terms of the Sri Lanka National Policy

- **Effective Enforcement of Law against**, production, **smuggling, trafficking and use of illicit drugs**
- **Effective monitoring of imports, export, distribution of drugs** and precursor chemicals under control
- **Preventing the use of drugs reducing the adverse consequences of drug abuse**
- Supporting regional and international initiatives related to drug abuse, prevention and control

Effective Approach to Drug Problem

In terms of the National Policy



Supply Control

Efforts to curb access to illicit drugs through activities aimed at cultivation, production, and trafficking.

Demand Reduction

Prevention, treatment and rehabilitation activities

- Aimed at stopping drug use before it starts
- Discouraging initial drug use from progressing into problem drug use
- Ending addiction and its associated damaging health and crime consequences

NDDCB's role and responsibility

- **NDDCB has been designated as the focal point for control of Narcotic drugs and Psychotropic substances in Sri Lanka by the International Narcotics control Board in terms of International Conventions**.
- **NDDCB is obliged to implement the provisions of the international conventions**.
- As per mandate given by ***NDDCB Act No. 11 of 1984***, **NDDCB monitors and review the Sri Lanka National Policy** and coordinate the drug control activities of all relevant organizations.
- In terms of the **Section 3.1** of the **Sri Lanka National Policy, NDDCB plays a pivotal role at National and International level with regard to prevention and control of Narcotic drugs and psychotropic substances abuse**.

Effective Approach to Drug Problem

In terms of the National Policy

Coordinated strategy & shared responsibility

Awareness of the extent of the drug problem at global, regional and at country level

- Emerging threats and the impact of drug trafficking and abuse and their adverse consequences relating to
  - the health and welfare of people with permanent physical and emotional damage,
  - overdose deaths,
  - drug associated illnesses and strained healthcare systems,
  - threat to security and stability of regions and countries,
  - threat to the socioeconomic development of countries by loss of productivity,
  - crime development and over burdened criminal justice systems.

Vital role of the scientific expertise in addressing the drug problem

Awareness on the urgent need, the significance and the vital role of scientific experts in finding solutions for reducing adverse consequences to the barest minimum possible and perverting drug trafficking and abuse in order to protect the right of people to lead a healthy way of life, promote sustainable social and economic development and for the achievement of security and justice for all by making the country safer from, drugs, and related crime.

Awareness of scientific professionals the current challenge and emerging drug control threats by paying attention to highest priority challenges.

Scientific approach through comprehensive, balanced and coordinated strategy

In such a strategy with enhanced scientific evidences and scientific expert involvement, supply control and demand reduction will reinforce each other and the role of the laboratories need to be identified and the contribution of the laboratories to various sectors of drug control and crime prevention need to be enhanced through strengthened coordination with agencies such as National Competent Authorities for drug control for policy making and situation assessment, Criminal justice system, Law enforcement, Health authorities, Treatment and rehabilitation setting, Preventive education.

Challenges on National Policy strategies implementation

- **Inadequate scientific input** to establish strategies for evidence based policy making
- **Limited** Intra- and Inter- agencies coordination and cooperation in drug control measures

Situation assessment of the drug problem

- In order to have an effective drug control systems in a country the situation assessment and institutional analysis for the capacity should be a continuous process.
- Scientific evidences play an important role in identification of adequate supply control measures is applied and they are effective in addressing emerging threats. Details relating to above are indicated below;

Scientific Research on **Drug Supply Control and Alternative Development Strategies**

Scientific Evidence

- Provision of scientific evidence for Criminal Justice System
  - Scientific evidence to solve forensic case work through laboratory analysis
- Technical assistance to drug law enforcement agencies
  - Identification of suspected drugs for evidential purposes
- Technical assistance to agencies involved in monitoring of import, export, distribution, transport and dispose of controlled drugs/substances and precursor chmecials

Challenges for supply control

- Expansion of online communications, finance and which creates opportunities for drug trafficking organizations to blend their operations into legitimate economic activities.
- Networks of drug trafficing groups make cross-border crimes easier to commit.
- Organized drug traffickig groups exploit technological advances for offensive and defensive purposes.
- Drug trafficking organizations exploit scientific developments to invest more heavily in the production of synthetic drugs for the illicit market
- Adoption of techniques that enable organizations engaged in illicit drug trafficking and production to avoid identification and prosecution.

- Utilize very sophisticated techniques for modus operandi to hide the true nature of drugs which are available in the drug market as legal products,
- use of legal procedures such as postal services and internet services, social media and dark net websites for distribution of drugs,
- emergence of new psychoactive substances as alternative to controlled drugs, emergence at an unprecedented rate with structural diversions which poses serious health threats and their transient nature on the drug market.

Scientific Expert Witness to solve complex drug related cases

- In drug-related criminal prosecution the expert witness, will usually be required to only give evidence as to the identity of the drug and its purity.
- This type of evidence provides little useful information other than what is needed to assist the jury in determining guilt or innocence and the judge in determining an appropriate sentence.
- In very complex drug-related cases, scientific evidence shall be utilized in numerous ways without limiting to the identity of the drug substances in the drug seizures.
- When the drug is chemically examined beyond its identity, the drug gives much more details on its history.

- Similarities and the differences of the chemical profile of drug samples – Are two or more samples connected?
- Does this **relationship provide a link between**, for example, a drug dealer and a user?
- Does the relationship between samples provide any useful information relating to national, regional or international drug supply and distribution networks or any information as to the extent of such networks?
- Where does the sample come from (e.g., **geographic origin, laboratory source**)?
- What is the method of clandestine drug production? Which specific chemicals are employed in the manufacturing process ?

Drug characterization/impurity profiling, with special focus on methamphetamine: Recent work of the United Nations International Drug Control Programme

Article (PDF Available) *in* Bulletin on narcotics 51(1):97-117 · January 1999 *with* 424 Reads

Barbara Remberg
12.01 · United Nations Office on Drugs and Crime

A.H. Stead

Forensic Sci Int. 2001 Dec 1;123(2-3):81-8.

Heroin impurity profiling: trends throughout a decade of experimenting.

Dams R[1], Benijts T, Lambert WE, Massart DL, De Leenheer AP.

Author information

Abstract

Heroin is still one of the most frequently abused drugs of today. All over the world, law enforcement agencies try to eradicate the illicit production and trafficking of this potent and highly addictive narcotic. To this aim, important information is provided by physical and chemical toxicological analysis of confiscated samples, with special attention for the identification and the quantification of minor components, such as the impurities related to the origin and manufacturing. By combining these data complex characterisations, i.e. impurity profiles, chemical signatures or fingerprints, can be obtained and used for comparative analysis. This review focuses on heroin impurity profiling during the 1990s, proclaimed by the United Nations as the 'Decade for Eradicating Drug Abuse'. Special attention will be given to the new trends in analytical techniques as well as in data handling strategies, so called chemometrics, to produce these profiles. The latter can be used in comparative analysis of seized heroin samples for tactical (batch-to-batch comparison) and strategic (origin determination) intelligence purposes.

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RESEARCH ARTICLE

Illicit drug profiling: the Australian experience

Michael Collins[a]*, Juuso Huttunen[b], Ian Evans[b] and James Robertson[b]

[a]*Australian Forensic Drug Laboratory, National Measurement Institute*
[b]*Australian Federal Police*

Illicit drug profiling provides law enforcement agencies with physical and chemical information that may assist in identifying and disrupting drug trafficking organizations. Detailed chemical analysis provides information which when compared to historical data allows investigators to determine the geo-location of cultivated drugs such as cocaine and heroin. Similar analyses of synthetic drugs afford information on synthetic route and precursor chemicals. When combined with physical evidence this information may also be used to help establish links between different seizures of illicit drugs. The Australian Illicit Drug Intelligence Program, which is a collaboration between the Australian Federal Police and the Australian National Measurement Institute, was established to acquire chemical and profiling data on illicit drugs and disseminate information to appropriate national and international governmental agencies

Keywords: Illicit drugs; profiling; heroin; cocaine; amphetamine type stimulants

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Establishment of an operational system for drug profiling: a Swiss experience

S. Ioset, P. Esseiva, O. Ribaux, C. Weyermann, F. Anglada, S. Lociciro, P. Hayoz, I. Baer, L. Gasté, A.-L. Terrettaz-Zufferey, C. Delaporte and P. Margot

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ABSTRACT

The present article describes the profiling process developed at the Institute of Forensic Science of the School of Crime Sciences of the Faculty of Law at the University of Lausanne. The technique is oriented towards an operational approach that can be applied directly by drug units of local law enforcement authorities.

The background of the development of that technique and issues relating to data sources are outlined. Analytical, statistical and computerized methods for detecting, managing and visualizing linkages are examined in the context of drug profiling. Harmonization of methods and operational use of links are discussed and explained using examples. Finally, adequate communication of forensic information/intelligence is explored as an area of development.

This endeavour has helped demonstrate the enormous potential that linking seizures made in different regional markets has for police investigations.

The next stage is to focus on implementing this model in a more systematic manner and, if possible, at the national level and even the international level. That harmonization of methods should be pursued in order to maximize the potential of

Drug profiling: a new scientific contribution to law enforcement operations in Viet Nam

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ABSTRACT

Since 1995 heroin sample comparisons have been carried out in Viet Nam to establish links between wholesalers and retailers. To that end, the physical and chemical characteristics of samples are analysed: their colour, the packaging material, including fingerprints, diacetylmorphine (heroin) content and the composition of some main alkaloids.

At the beginning of 2002, having acquired expertise on impurity profiling and with the support of new instruments, the Institute of Forensic Sciences of Viet Nam introduced the routine impurity profiling of seized heroin and methamphetamine and later undertook to explain that process to national law enforcement bodies.

Since then, 375 heroin and 29 methamphetamine samples have been analysed for major and minor impurities. Substances detected in the analysis of illicit heroin include diacetylmorphine, morphine, codeine, O^6-monoacetylmorphine and acetylcodeine as well as adulterants such as paracetamol and caffeine. Since methamphetamine impurity profiling began, 29 samples have so far been analysed, and some samples have been grouped through the application of cluster analysis.

In the case of heroin, impurity profiling has established a link between two major trafficking groups suspected of obtaining heroin from the same source of production. Analysis has also revealed a link between one wholesaler and several retailers in one region. In addition, impurity profiling provides new information on the preparation and production of some methamphetamine and fake Ecstasy tablets.

Residual solvents in methylenedioxymethamphetamine tablets as a source of strategic information and as a tool for comparative analysis: the development and application of a static headspace gas chromatography/mass spectrometry method*

H. A. A. H. VISSER, M. VISSER-VAN LEEUWEN and H. HUIZER

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Practical consideration

- Availability of reference standards,
- Validated methods for analysis
- Unavailability of commercial suppliers of reference standards to keep with the pace with the rapid emergence
- Cost and the difficulty in use of non traditional methods such as NMR for confirmation of identity of such substances,
- Collaboration with all relevant agencies

Proposed research areas

- **Identification of dynamics of Drug Market**
- **Identification of effectiveness of supply control activities of drug law enforcement agencies**
  - Research on analysis price vs. purity relationship of controlled drugs

– Conducting research on drug characterization and impurity profiling studies for identifications of sources of drugs such as geographical origin, to obtain specific links between different stages of drug supply, identification of distribution network, monitoring manufacturing methods and identification of precursor chemicals used which are important in precursor control measures.

- Conducting research on development of new methods for identification of New psychoactive substances
- Conducting research on drug screening methods for preliminary identification of NPS which can be used for field drug detection kits

- **Provision of scientific evidences for criminal justice systems**
  - Identity of the sample
  - Identification of drug dependant persons

Scientific Research on

Demand Reduction (Prevention, Treatment and Rehabilitation)

Prescribing treatment for psychological disorders in hospital setting

Analytical findings from biological samples such as urine, blood or hair can be analysed for the presence of metabolites of drugs of abuse for various purposes as indicated below for reducing health consequences of drug abuse, treatment of patients with psychological disorders to identify the reason behind it is due to abuse of drugs or not and to prescribe treatment.

For treatment and rehabilitation of drug dependent persons

- Drug dependent persons are being tested to identify various reasons such as multiple drug abuse, to identify the drugs they are dependent on to select proper treatment methodology, to identify whether the person is abstained from drug abuse.

Screening of employees of government and private sector agencies and work places (Work place drug testing)

- Drug dependence severely affects the loss productivity of employees/workers through deterioration of their physical fitness to work and also to a higher extent the psychological conditions and metal well being.

- Therefore, it is the responsibility of scientific expertise to make aware of the use of scientific evidence for identification of such persons and to promote prevention and rehabilitation, share technical expertise to establish code of conduct with employers to conduct drug screening at recruitment and random basis as a preventive measure.

Screening of drivers for drugs of abuse (Road-side drug testing)

- In order to prevent accidents and related issues due to consequences of drug dependence it is very essential that drug screenings are conducted for the drivers. With regard to this scientific expert in national drug control laboratories may share their expertise in order to develop effective control measures to assist motor traffic department, police and justice system to prevent accidents and other related issues and/or direct such persons for rehabilitation processes.

- Drug screening for educational purposes
- Drug screening in prison settings

Need for research in demand reduction

Research areas

- Scientific evidences to understand the problem through trend analysis
- Scientific assessment on effectiveness of the legislative measures in terms of international conventions
- Development of validated test methods, harmonized analytical methods and acquire necessary tools for identification of emerging drugs with chemical divergence
- In depth analysis into route of synthesis to identify precursors to find ways to control the situation through precursor control measures
- Study of dynamics of drug market of NPS through analysis of price vs. purity relationship

- Toxicological analysis of NPS to promote health interventions
- Long term and short term effects and risk of abuse of NPS
- Scientific evidences relating to the characteristics and patterns associated with NPS use
- Scientific study on psychology and neurochemistry, biochemical pathways relating to motivational factors for NPS use such as paradigm of modifying perceptions, curiosity, sociability, search for energy, functional expectations, driving initial experimentations.
- Study of secretion of different neurochemicals relating to thought processes explained in 9 above.
- Study of neutralizing the effect of those chemicals through restoring such chemicals with the change of thought processes

- Scientific study on effectiveness of prevention interventions by skill development and coping strategies independently of the substance abused
- Scientific study of harm reduction strategies.
- Scientific evaluation of the effectiveness of different treatment methodologies and intervention methods

Need for Mindfulness Meditation based research for demand reduction

- Review scientifically the existing evidence on mindfulness meditation based intervention for substance use disorders.
- Mindfulness practice has proved the significant reduction in relapse rates. However, it has been highlighted that the need for new treatment modalities related to mindfulness practice to better assist drug dependent persons in their recovery processes.
- There is a paucity of scientific research to support this efficacy. Therefore more research need to be conducted for existing evidence for MM based therapies for addiction disorders in clinical setting. Joint collaboration with psychologists, psychiatrists, biochemists, analytical chemists is highlighted for efficient and effective outcome of these research projects.

- On considering current studies the mindfulness practice may support long term outcomes by strengthening the ability to monitor and skillfully cope with the discomfort associated with craving or negative effect thus supporting long term outcomes such as
  - ✓ Reduce the frequency and severity of substance misuse
  - ✓ Reduce intensity for craving for NPS
  - ✓ Reduce severity of stress
- Further research is needed to standardized MM based therapy with scientific parameters to be used as the best treatment methodology as a prevention, treatment and rehabilitation strategy.

Coordination and cooperation among laboratories

- All the laboratories should be facilitated to disseminate information obtained from research findings, analytical methodologies through inter- and intra- laboratory network.
- Establishment of Science Technology and Innovation platform
- Analytical capabilities of the laboratories need to be enhanced through donor programmes
- Provide accurate evidence and recommendations in timely manner for designing effective policy interventions

Assessment of Institutional framework analysis of the National Drug control laboratories

1. Review of the current status of the laboratory; functions and activities
   - Current mandate – legal and procedural practice
   - Operational procedures
   - Staff requirements
   - Current capacity of gathering information
   - Details of no. of samples analysed
   - Chain of custody requirements
   - Storage requirements and disposal
   - Legal requirements
   - Internal quality control systems
   - Participation of International Proficiency testing programmes

2. Analytical methodologies
   - Test methods for screening/identification/confirmation (qualitative & quantitative)
   - Availability of equipment, chemicals and reference standards
   - Availability of manuals, text books and references
   - Problems encountered

Status of coordination and collaboration at National Regional and International

- Nation al level coordination and collaboration with Criminal justice system , Law enforcement, Health authorities, National Competent Authority on drug control, Preventive education, treatment and rehabilitation setting, Other drug control laboratories, Other relevant agencies
- Regional level collaboration (Networks)
- Collaboration with countries outside the region (Networking of network)

Review of the current status of the laboratory; functions and activities

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Analytical methodologies

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- Problems encountered

Challenges and the problems encountered by laboratories

- Infrastructure facilities for analysis and research
  - Equipment
  - Reference standards
  - Testing procedures and methods
  - Workload
  - Scientific literature
  - Availability of research culture
- Expertise for analysis and research
  - Educational qualifications, skills, training

- Administrative
  - Financial and human resources limitations
  - Organizational structure
  - Building facilities
  - Safety and security
- Legal requirements
  - Designation of the laboratory
  - Legal authority
- Technical cooperation
- Coordination and collaborations with all relevant agencies relating to prevention and control of substances of abuse

Thank you for your kind attention.